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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,593	SHEN ET AL.	
	Examiner	**Art Unit**	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☒ Claim(s) *25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Due to the large number of references cited by the applicant, it would be helpful to the prosecution of the instant application if a statement of relevance were provided for each cited reference.

Claim Objections

2. Claims 25 depends from claim 26; however, this dependency on claim 26 seems to be an error. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-8, 11, 14-23, 25-30, and 32-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Goodman et al. (US Patent No. 6636529).

Regarding claim 1, Goodman et al. disclose an optical fiber communication network utilizing frequency division multiplexing, a variable rate input converter comprising: a clock and data recovery unit for recovering a first clock signal representing the non-uniform rate of the input signal, and recovering data of the incoming signal (fig. 4, elements 440 and col. 9, lines

52-58); a demultiplexer coupled to receive the incoming non-uniform rate signal for demultiplexing to form a plurality of separate signals using time division multiplexing techniques (col. 9, lines 56-61), where the serial to parallel conversion and 8-bit bus indicates time-division demultiplexing; a buffer coupled to the demultiplexer to receive and store the plurality of separate signals (col. 10, lines 1-4); a generation unit coupled to receive the separate signals from the buffer, said generation unit transforming the separate signals to one or more pseudo signals comprising a uniform rate within a tolerance range (fig. 4, elements 500, 510 and 520 and col. 10, lines 13-39); a synthesizer coupled to receive the first clock signal from the clock and data recovery unit for generating a second clock signal comprising a uniform rate within a tolerance range for the generated pseudo signal using the recovered first clock signal (fig. 4, element 490 and col. 5, lines 52-60 and col. 10, lines 1-4); and a control unit communicatively coupled to the clock and data recovery unit, the demultiplexer, the buffer and the generation unit (fig. 4, elements 480 and 500 and col. 9, lines 64-67 and col. 10, lines 13-17).

Regarding claim 2, Goodman et al. disclose the variable rate converter of claim 1 wherein the second clock signal for the generated pseudo signal is in phase alignment with the recovered first clock signal (col. 10, lines 1-4), where using the FIFO for timing alignment between the incoming data and the SDH container indicates phase alignment between the two signals.

Regarding claim 3, Goodman et al. disclose the variable rate input converter of claim 1 wherein the pseudo signal comprises a frame comprising a payload portion comprising a plurality of subpackets, each subpacket comprising data of the non-uniform rate input signal, and stuff bytes comprising null data to fill unused parts of the payload portion (col. 10, lines 4-12 and lines 26-32).

Regarding claim 4, Goodman et al. disclose the variable rate input converter of claim 3 wherein each frame includes an extra data indicator (col. 10, lines 26-32).

Regarding claim 5, Goodman et al. disclose the variable rate input converter of claim 4 wherein a number of bytes in each sub-packet and a number of stuff bytes is calculated based on the non-uniform rate of the input signal and the uniform rate of the pseudo signal (col. 10, lines 4-32).

Regarding claim 6, Goodman et al. disclose the variable rate input converter of claim 1 wherein the buffer is a plurality of first-in-first-out buffers with one first-in-first-out buffer for each separate signal (fig. 4, element 490 and col. 10, lines 1-4), where an FIFO accepting an 8-bit bus input would include a separate sub-FIFO for each parallel bit signal.

Regarding claim 7, Goodman et al. disclose the variable rate input converter of claim 1 further comprising a transceiver capable of receiving signals at various non-uniform rates and comprising an output coupled to the input of the clock and data recovery unit for forwarding the non-uniform rate signal (fig. 3, elements 340 and col. 9, lines 27-37).

Regarding claim 8, Goodman et al. disclose the variable rate input converter of claim 7, wherein the transceiver accepts both asynchronous and synchronous input signals (col. 5, line 47 to col. 7, line 30).

Regarding claim 11, Goodman et al. disclose the variable rate input converter of claim 1 and disclose that the uniform signal is a SONET/SDH signal (col. 3, lines 56-67), where a standard SONET/SDH signal is an STS-3 signal (col. 6, lines 10-38), which has a rate of 155.52 Mbps.

Regarding claim 14, Goodman et al. disclose the variable rate input converter of claim 1 further comprising: a serial to parallel converter being coupled to receive a serial bit stream from said clock and data recovery unit, said converter converting the serial bit stream into a parallel

byte stream (col. 9, lines 52-58); and a parallel to serial converter being coupled to receive one or more generated pseudo signals from the generation unit for converting it to a serial bit format (fig. 4, element 520 and col. 10, lines 34-39).

Regarding claim 15, Goodman et al. disclose a data transmission frame format for a signal comprising a uniform rate, the format comprising a payload portion comprising a plurality of subpackets, each subpacket comprising data of a non-uniform rate input signal and stuff bytes, the stuff bytes comprising null data to fill unused parts of the payload portion (col. 10, lines 4-32).

Regarding claim 16, Goodman et al. disclose the data transmission format of claim 15 further comprising an extra data indicator (col. 10, lines 26-31).

Regarding claim 17, Goodman et al. disclose the data transmission format of claim 15 further comprising a number of bytes in each sub-packet determined from the non-uniform rate of the input signal and a number of stuff bytes determined from the non-uniform rate of the input signal and the uniform rate of the pseudo signal (col. 10, lines 4-32).

Regarding claim 18, Goodman et al. disclose the data transmission format of claim 15 further comprising a valid framing header for the uniform rate (col. 10, lines 34-39).

Regarding claim 19, Goodman et al. disclose in an optical fiber communication network utilizing frequency division multiplexing, means for converting a non-uniform rate input signal to a pseudo signal comprising a uniform rate comprising: means for recovering a first clock signal representing the non-uniform rate of the input signal and recovering data of the incoming signal (fig. 4, elements 440 and col. 9, lines 52-58); means for demultiplexing the incoming non-uniform rate signal into a plurality of separate signals using time division multiplexing techniques, the means for demultiplexing the incoming non-uniform rate signal being coupled to the means for recovering a first clock signal representing the non-uniform rate of the input signal

and recovering data of the incoming signal (col. 9, lines 56-61), where the serial to parallel conversion and 8-bit bus indicates time-division demultiplexing; means for receiving and storing the plurality of separate signals (col. 10, lines 1-4); means for transforming the separate signals to one or more pseudo signals at a uniform rate within a tolerance range, the means for transforming receiving the separate signals at the same time from the means for receiving and storing the plurality of separate signals (fig. 4, elements 500, 510 and 520 and col. 10, lines 13-39); coupled to receive the first clock signal from the means for recovering a first clock signal representing the non-uniform rate, means for generating a second clock signal at a uniform rate within a tolerance range using the recovered first clock signal for the generated pseudo signals (fig. 4, element 490 and col. 5, lines 52-60 and col. 10, lines 1-4); and means for controlling being communicatively coupled to the means for recovering a first clock signal representing the non-uniform rate, the means for demultiplexing incoming non-uniform rate signal into a plurality of separate signals using time division multiplexing techniques, the means for receiving and storing the plurality of separate signals, the means for transforming the separate signals to a pseudo signal at a uniform rate; and the means for generating a second clock at a uniform rate for the generated pseudo signal (fig. 4, elements 480 and 500 and col. 9, lines 64-67 and col. 10, lines 13-17).

Regarding claim 20, Goodman et al. disclose an optical fiber communication network utilizing frequency division multiplexing, a method for converting a non-uniform rate input signal into a uniform rate output signal, the method comprising the steps of: recovering a first clock signal representing the non-uniform rate and recovering data of the incoming signal (fig. 4, elements 440 and col. 9, lines 52-58); demultiplexing the incoming non-uniform rate signal to form a plurality of separate signals using time division multiplexing techniques (col. 9, lines 56-61), where the serial to parallel conversion and 8-bit bus indicates time-division demultiplexing;

storing the plurality of separate signals (col. 10, lines 1-4); and transforming the separate signals to one or more pseudo signals at a uniform rate within a tolerance range (fig. 4, elements 500, 510 and 520 and col. 10, lines 13-39); generating a second clock signal at a uniform rate for the generated pseudo signal using the recovered first clock signal (fig. 4, element 490 and col. 5, lines 52-60 and col. 10, lines 1-4).

Regarding claim 21, Goodman et al. disclose the method of claim 20, further comprising: causing the insertion of a marker bit at each interval of a certain data length in each of the separate signals (col. 10, lines 26-32).

Regarding claim 22, Goodman et al. disclose the method of claim 20, wherein the step of generating a pseudo signal includes producing a frame comprising a plurality of subpackets in a payload portion comprising data of the original input signal and stuff bytes, the stuff bytes comprising null data to fill unused parts of the payload portion (col. 10, lines 4-12 and lines 26-32).

Regarding claim 25, Goodman et al. disclose that the step of generating a pseudo signal includes producing a frame including an extra data indicator (col. 10, lines 26-32).

Regarding claim 26, Goodman et al. disclose in an optical fiber communication network utilizing frequency division multiplexing, a variable rate output converter comprising: a clock and data recovery unit for recovering a first clock signal representing an incoming pseudo signal and recovering frames of data of the incoming pseudo signal (col. 11, lines 10-27); a decomposition unit coupled to receive frames of the incoming pseudo signal and extracting original of a non-uniform rate signal from subpackets (fig. 5 and col. 10, lines 42-58; and col. 11, lines 40-63); a buffer coupled to the decomposition unit to receive and store the original data bytes (fig. 5, element 560); a multiplexer coupled to receive the original data packets from the buffer and for re-constructing the original non-uniform rate signal from a plurality of original data bytes and a

synthesizer unit for generating the original non-uniform rate signal using the first clock signal representing the uniform rate (fig. 5, element 590 and col. 10, lines 61-66); and a control unit communicatively coupled to the clock and data recovery unit, the multiplexer, the buffer, the synthesizer unit and the decomposition unit (fig. 5, element 580 and col. 10, line 56 to col. 11, line 2).

Regarding claim 27, Goodman et al. disclose the variable rate output converter of claim 26 wherein the decomposition unit receives data frames and strips out overhead and stuff bytes, and converts the original data of the subpackets into a plurality of separate signals (fig. 5 and col. 10, lines 42-58; and col. 11, lines 40-63).

Regarding claim 28, Goodman et al. disclose the variable rate output converter of claim 24 wherein the multiplexer searches for a valid marker for alignment of the bytes in the signals and reconstructs the non-uniform rate data stream (col. 10, lines 56-67).

Regarding claim 29, Goodman et al. disclose the variable rate output converter of claim 26 wherein the decomposition unit includes a frame counter that uses a start of frame information to locate the overhead byte positions and an encapsulated data sub-packet (col. 11, line 40 to col. 12, line 12).

Regarding claim 30, Goodman et al. disclose the variable rate output converter of claim 26 wherein the decomposition unit also performs fault monitoring (fig. 5, element 590 and col. 11, lines 3-6).

Regarding claim 32, Goodman et al. disclose in an optical fiber communication network utilizing frequency division multiplexing, a method for converting a pseudo signal comprising a uniform rate to a non-uniform rate output signal, the method comprising: recovering a first clock signal representing the rate of an incoming pseudo signal and recovering frames of an incoming pseudo signal (col. 11, lines 10-27); and decomposing the frames of incoming uniform signal

and extracting from sub-packets data bytes of a non-uniform rate signal from the pseudo signal ; receiving and storing the original data bytes (fig. 5 and col. 10, lines 42-58; and col. 11, lines 40-63); a re-constructing the original non-uniform rate signal from a plurality of original data bytes and generating the original non-uniform rate signal using the first clock signal representing the rate of the incoming pseudo signal (fig. 5, element 590 and col. 10, lines 61-66).

Regarding claim 33, Goodman et al. disclose the method of claim 32, wherein decomposing the incoming uniform signal comprises stripping out overhead and stuff bytes (fig. 5 and col. 42-46).

Regarding claim 34, Goodman et al. disclose the method of claim 32, wherein the step of multiplexing searches for a valid header byte, aligns the bytes and reconstructs the non-uniform rate signal (fig. 5, element 590 and col. 10, lines 56-67; and col. 11, line 40 to col. 12, line 12).

Regarding claim 35, Goodman et al. disclose the method of claim 32, further comprising the step of performing fault monitoring (fig. 5, element 590 and col. 11, lines 3-6).

Regarding claim 36, Goodman et al. disclose in an optical fiber communication network utilizing frequency division multiplexing, means for converting a pseudo signal comprising a uniform rate to a non-uniform rate output signal comprising: means for recovering a first clock signal representing the rate of an incoming pseudo signal further comprising means for recovering frames of an incoming pseudo signal (col. 11, lines 10-27); coupled to the means for recovering, means for decomposing the frames of the incoming signal and extracting packets comprising data of an original non-uniform rate signal from the pseudo signal (fig. 5 and col. 10, lines 42-58; and col. 11, lines 40-63); means for storing the original data coupled to receive the original data from the means for decomposing (fig. 5, element 560); means for re-constructing the original non-uniform rate signal from a plurality of original data bytes, the means for re-

constructing coupled to receive the original data bytes from the means for storing and means for generating a second clock signal representing the rate of the original non-uniform rate signal using the first clock signal representing the rate of the incoming pseudo signal, said means for generating coupled to receive the first clock signal from the means for recovering and outputting the second clock signal to a means for converting the re-constructed original non-uniform signal to a serial bit stream (fig. 5, element 590 and col. 10, lines 61-66 and col. 11, line 10 to col. 12, line 12).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 9, 10, 12, 13, 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. (US Patent No. 6636529) in view of Solheim et al. (US Patent No. 6522671).

Regarding claim 9, Goodman et al. disclose the variable rate input converter of claim 1 but does not disclose that the synthesizer unit comprises frequency dividers, each comprising an integer divisor; and that the control unit further comprises instructions for causing the selection of integer divisor values optimized for the non-uniform input rate and the tuning of a uniform rate clock output frequency within a tolerance range for the uniform rate signal. Solheim et al. disclose a clock and data recovery and demultiplexing unit for use in adapting an any input signal to be carried in a synchronous output signal, where the CDR and DEMUX unit

has integer divisor frequency dividers and a control unit for selecting the frequency dividers optimized for the input signal rate to produce a tuned output clock (fig. 5 and col. 5, lines 1-3 and line 43 to col. 6, line 49). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the CDR and DEMUX unit disclosed by Solheim et al. for the recovery and demux unit of Goodman et al. to be able to selectively determine the best recovery clock frequency matching the frequency of the input signal, as taught by Solheim et al.

Regarding claim 10, Goodman et al. in view of Solheim et al. disclose the synthesizer unit of claim 9 and disclose that the uniform signal is a SONET/SDH signal (col. 3, lines 56-67), where a SONET/SDH signal has a tolerance range about twenty-two parts per million (col. 5, lines 52-60), and where a standard SONET/SDH signal is an STS-3 signal (col. 6, lines 10-38), which has a rate of 155.52 Mbps.

Regarding claim 12, Goodman et al. disclose the variable rate input converter of claim 1 but do not disclose a search mode wherein the clock and data recovery unit selects non-uniform target frequencies from a look-up table in the order lower frequencies to higher frequencies until either the non-uniform rate is determined or all the values in the table have been selected. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Solheim et al. with Goodman et al. as described above for claim 9, and further, Solheim et al. teaches the control software for the recovery unit using software to cycle through the combinations of dividers to find the best recovery clock frequency. It would have been obvious to one of ordinary skill in the art at the time of the invention that this software cycle routine would have used a look up table of the ordered divider frequencies, since a software search and compare algorithm using a look table of values is well known in the art.

Regarding claim 13, Goodman et al. in view of Solheim et al. disclose the variable rate input converter of claim 12 but do not disclose that the look-up table is field programmable;

however, it further would have been obvious to one of ordinary skill in the art at the time of the invention to used a field programmable device to store the values in the look up table, as such storage of values for access by a software search and compare algorithm is well know in the art.

Regarding claim 24, Goodman et al. disclose the method of claim 20 and disclose that the uniform signal is a SONET/SDH signal (col. 3, lines 56-67), where a SONET/SDH signal has a tolerance range about twenty-two parts per million (col. 5, lines 52-60), but do not disclose that determining a data rate of a non-uniform rate input signal and recovering a first clock signal representing the non-uniform rate further comprises: selecting integer divisor values for frequency dividers optimized for the non-uniform input rate. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Solheim et al. with Goodman et al. as described for claim 9 above.

Regarding claim 31, Goodman et al. disclose the variable rate output converter of claim 26 but do not disclose that the synthesizer unit comprises frequency dividers, each comprising an integer divisor; and wherein the control unit further comprises instructions for causing the selection of integer divisor values optimized for recovering the non-uniform output rate and allowing a relaxation of a uniform rate within a tolerance range for the incoming pseudo signal. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Solheim et al. with Goodman et al. as described above for claim 9.

Conclusion

7. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (703) 305-0370. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

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